U.S./China Renewable Energy Forum

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Director

Office of Solar Energy Technologies

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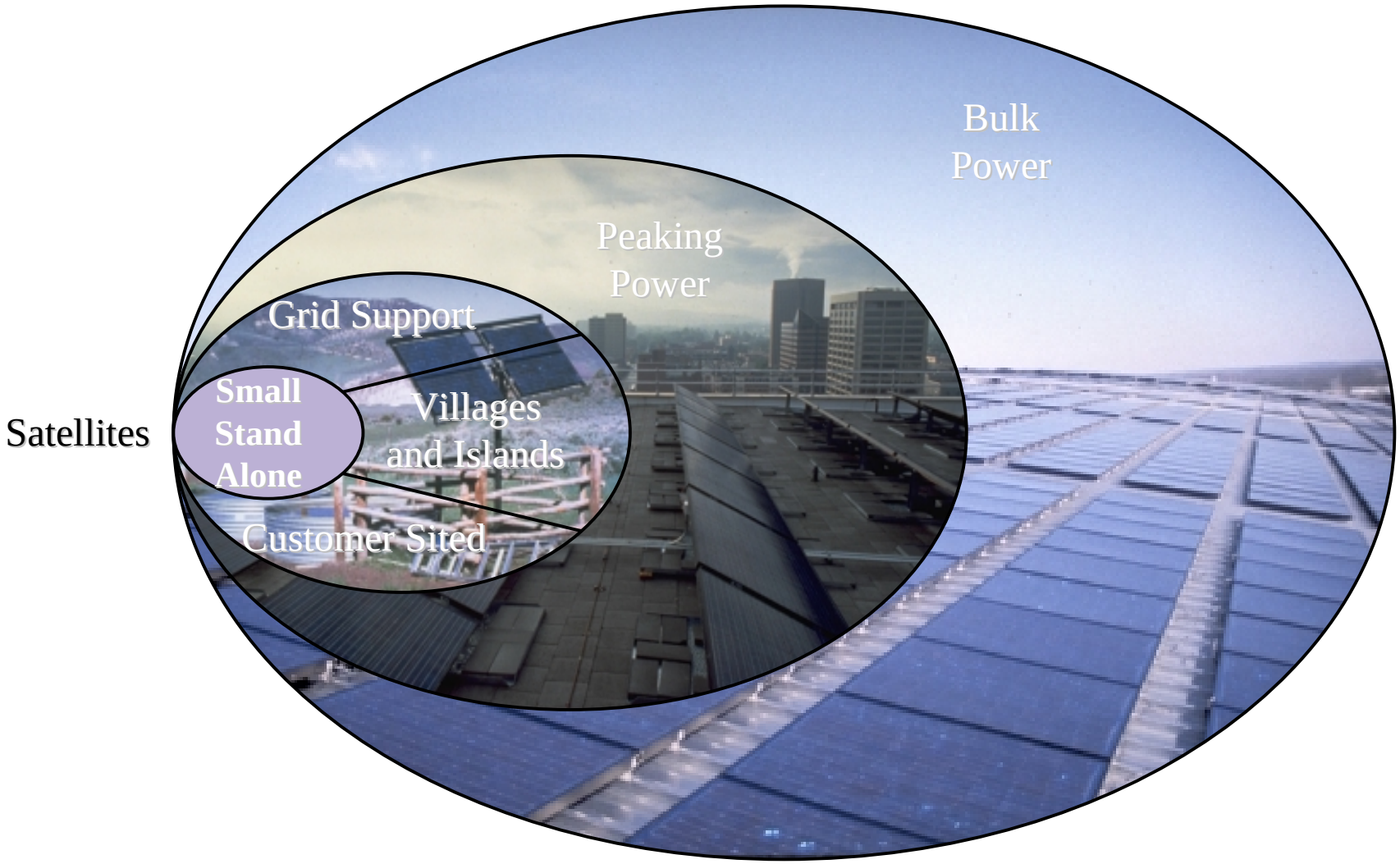
For more information:
www.eren.doe.gov/power/photovoltaics
www.eren.doe.gov/power/solarbuildings
www.eren.doe.gov/power /csp

National Center for Photovoltaics:
www.nrel.gov/ncpv/

Market Progression



Photovoltaics

Solar Buildings

Concentrating Solar Power

Dispatchable Power Systems

- Parabolic Troughs

- Power Towers

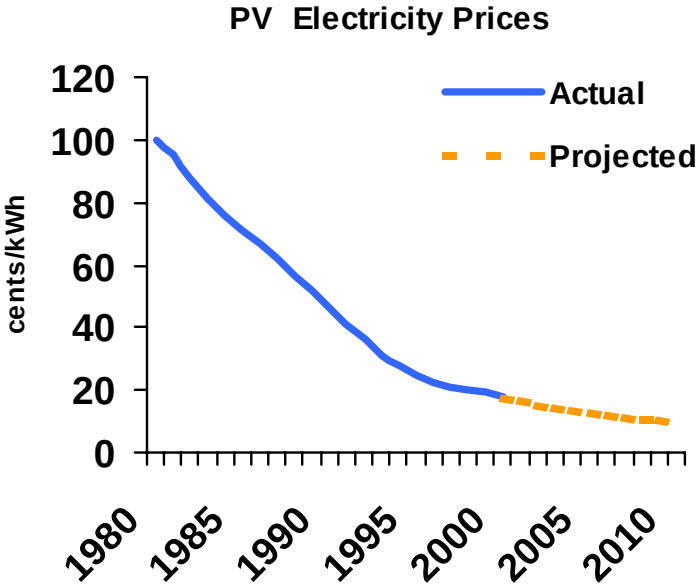
- Dish/Engine Remote

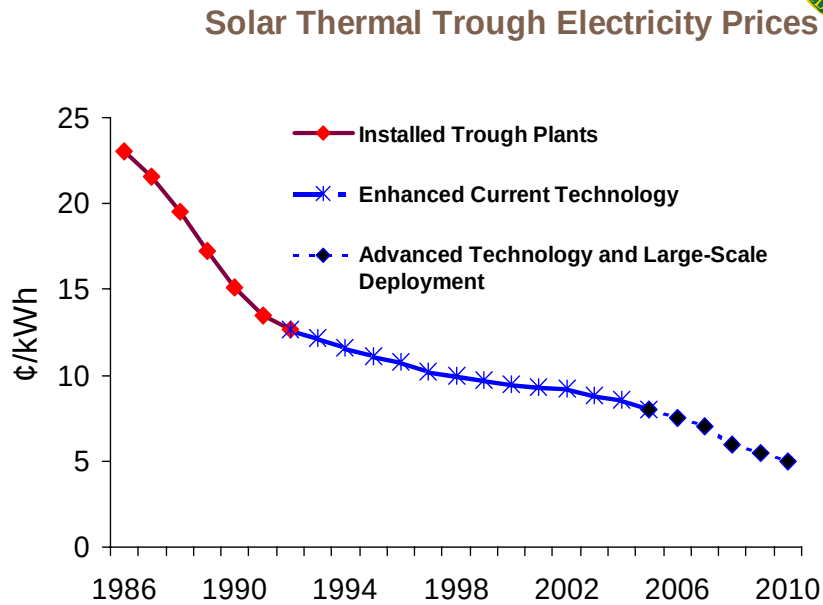
Distributed Power Systems

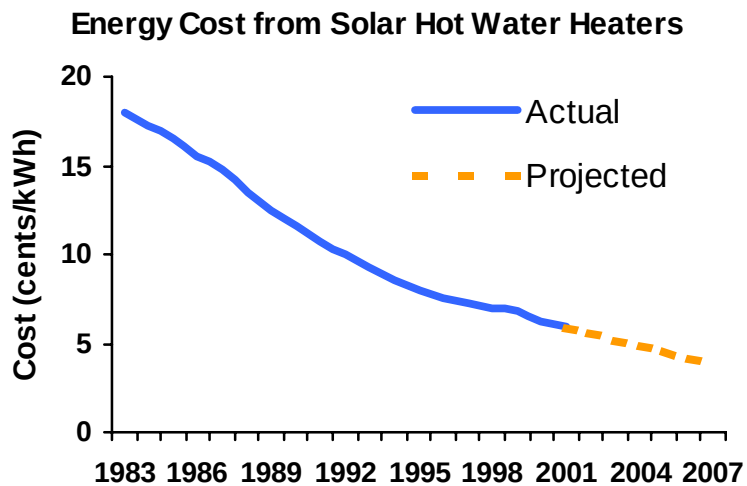
- Dish/Engine on-Grid

Integration of Technologies

Declining Costs in All Technologies







Outstanding Laboratories

Outstanding Laboratories

NCPV

The National Center for Photovoltaics was founded to mobilize national resources in PV by performing world-class research and development, promoting partnering and growth opportunities, and serving as a forum and information source for the PV community.

Sun♦Lab

Sun♦Lab is the Department of Energy's virtual laboratory that combines the expertise of Sandia National Laboratories and the National Renewable Energy Laboratory to assist industry in developing and commercializing concentrating solar power technologies.

NREL Sandia National Laboratories

International Funding Resources

- The World Bank
- US Agency for International Development
- International Finance Corporation (World Bank Group)
- Global Environment Facility (UN Development Programme, UN Environment Programme, World Bank)
- Asian Development Bank
- Indian Renewable Energy Development Agency
- International Fund for Renewable Energy and Energy Efficiency (USAID, US Dept of Energy, US Environmental Protection Agency)

PV Program Budget Snapshot

FY 2001 Program Snapshot: Photovoltaic Energy Systems

	FY 2000 Enacted	FY2001 Request	Change
Program Total	**$65.9M**	**$82.0M**	**+ $16.1M**
Fundamental research	14.2	20.3	+ 6.1
Advanced materials and devices	27.0	27.0	0
Technology development	24.7	34.7	+10.0

FY 2001 Highlights

- Stronger university fundamental research program for breakthroughs in lower cost materials
- Greater industry emphasis on low cost thin films (double conversion efficiency to 20%) and on high efficiency multi-junction concentrator cells (33% efficiency goal—1/3 of the sun)
- Greater emphasis on manufacturing R&D to develop new in-line process diagnostics needed for increased through put and lower-cost manufacturing.
- Industry Roadmap completed with aggressive goals to 2020

Solar Buildings Program Budget Snapshot

FY 2001 Program Snapshot: Solar Buildings

	FY2000 Adjusted Appropriations	FY2001 Request	Change
Program Total	**$1.968M**	**$4.5M**	**+$2.53M**
Quality assurance	0.268	0	-0.268
Technology development	1.70	4.5	2.80

FY 2001 Highlights

- Program now focused on exploring the potential of solar energy to economically provide all the energy needed by buildings
- Potential for 50% cost reduction and 4 year payback for residential users of solar water heating
- Development of hybrid solar lighting that brings sunlight into the interior of buildings through fiber optics
- Coordination with Photovoltaics Program (building integrated PV) and Office of Building Technology, State and Community Programs (energy efficient buildings)

Concentrating Solar Power Program Budget Snapshot

FY 2001 Program Snapshot: Concentrating Solar Power

	FY2000 Enacted	FY2001 Request	Change
Program Total	**$15.2M**	**$15.0M**	**- $0.2M**
Distributed Power System Development	5.1	4.3	- 0.8
Dispatchable Power System Development	6.0	5.2	- 0.8
Advanced Components and System Research	4.1	5.5	+1.4

FY 2001 Highlights

Distributed Power: Dish/Engine System R&D

- 25kW Field Validations in Arizona and California
- 10kW Remote Power Systems installed on Tribal Lands in AZ and NM
- 1-5kW Competitive Solicitations for R&D on Residential Units

Dispatchable Power: Solar Trough Component R&D

- Develop and Field Validate Advanced Components to support resurgent US Industry in near-term opportunities
- Reduce the Cost of Solar Power from 12¢/kWh to under 8¢/kWh by 2005

Advanced R&D

- Concentrators; receivers; materials; long-term R&D

10 kW Remote System